Lessons Learned

1A: Use Inspired Research and Translation of Innovation to Production

- Virtual qualification / certification will become important in the near term and will need R&D to accelerate its application. To ensure timely adoption, qualifying AM requires moving beyond traditional means.
- Only one (qualified) investment casting house in all of Florida. Only one sand casting facility in Florida. Opportunity for AM to fill the void. R&D to prove out AM alternative would be needed.
- AM allows one to increase the design space and provides for precise placement. Biomedical and aerospace can benefit from this. For biomedical, initially external devices, eventually implants (although Stryker, Zimmer, and J&J have long used AM to mass produce titanium medical implants).
- R&D should develop materials specifically for AM to address major challenges (e.g. high temperature resistant alloys for thermal management for hypersonic applications).
- To support UIR and TIP we will need modeling, software, and test facilities.

Lessons Learned

1B: Market & Supply Chain Requirements

- Finding the right suppliers poses a huge challenge for Lead System Integrators (LSIs) in additive manufacturing. Supply Chain limitations for additive manufacturing includes downstream capabilities such as post-processing vendors (e.g. HIP, surface treatment, machining).
- LSIs desire collaboration in advancing a network of common suppliers and approaches to qualification (qualification may be 60% common).
- LSI's with in-house AM abilities may do make-vs-buy analyses. Suppliers need to get out and approach purchasers and demonstrate trust/reliability.
- Digital thread can help scale-up production.
- Successful small suppliers do not have to invent new materials or produce complex parts. They should challenge requirements that are not needed and say what they cannot do.

Lessons Learned

2A: Workforce Needs – Training, Resources & Approach

- Research that is built out of the needs of the industry.
- Update credentials to match what the industry needs now rather than 5 years ago. With Industry partnership, create/offer stackable credentials, which cost, timeline and etc. they can afford.
- Expand internships, apprenticeships, and job shadowing available.
- STEM camps – Introduce interesting science to students, communicate to parents (break through biases)
- Summary: An advanced additive manufacturing engine in Florida would create a multifactor market for the benefit of both public and private entities. An additive ecosystem would provide larger companies with the supply chain requirements to focus on larger projects while delivering smaller organization work and funding. This structure could expand to support the future of the additive manufacturing industry through curriculum development and 3D printing exposure for K-12 students, as well as partnerships between the industry and higher education for university students and current professionals

Lessons Learned

2B: Regional Ecosystem: Resources and Focus

- The task of economic development is to attract companies, advocate for business growth, and help create jobs. (“95% is new” or international – not inter-state poaching)
- Several organizations are available to help advance economic development and contribute to a NSF Engines Type II proposal, such as Northwest Florida Manufacturers Council, Florida Makes, Space Florida, Florida Economic Development Council, local development councils, 35 Mules.
- There are ample opportunities for property acquisition (greenfield or brownfield); capital expenditures (facilities or machinery) may be procured by an organization (Space Florida) and then subleased to prospective tenants/users -- below market price, no ad valorem tax.
- The eight military installations in the area are a great resource for research, business development, and talent (e.g. military personnel separating from service).
- An asset map of the region and the I-10 corridor might be useful. Development might augment and fill gaps in the asset map to build and claim a regional strength.

Lessons Learned

3B: Market & Supply Chain Requirements

- It is critical to keep cash flow and purchase order for the small business to survive and thrive. It is hard to survive on SBIR. Materials cost, training, maintenance, quality control, and compliance are all challenges to small businesses.
- Contracts are most important to facilitate the stability and sustainability of small business.
- A lot of needs for small businesses on resources, certification, regulations are common. A platform/ consortium/ accelerator would be helpful. An NSF Engine provides this kind of platform for small businesses.
- Small businesses have challenges on capital, finance and workforce support. When you are surviving on Purchase Order after Purchase Order, it is difficult to do strategic planning.
- Some small businesses are conservative and hesitate to take external funding support. How to bring the messages and how to expedite the growth of these conservative small businesses is important to the community.
- Consider some kind of mechanism to consolidate supplier chains as cohorts. As a group, the small business will share the resources (tools), complement capabilities, reduce upfront cost in regulation and requirements. NSF engine program provides this kind of mechanism for small businesses to grow together.

Lessons Learned

4B: Opportunity for All

- Different needs in the community: Start at a young age with students, train existing full-time workforce, train those exiting the military.
- NW Florida has some pockets of poverty. One county has 41% of children in qualifying for food assistance in school. We will have to be proactive reaching out to those communities.
- Difficulty of small counties to respond as staff members have many different duties
- A central place is needed where community members can meet all their needs
- People need to be served where they are – such as in the housing projects.
- AM Forward Florida has high African-American (FAMU is leading HCBU) and high Hispanic enrollment universities, representing great diversity.